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EXAMINER

PREISCH, N

ART UNIT

PAPER NUMBER

1764

DATE MAILED: 09/19/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

Office Action SummaryApplication No.
09/144,607Applicant(s)
Chester et al.Examiner
Nadine PreischGroup Art Unit
1764☒ Responsive to communication(s) filed on Jun 19, 2000☐ This action is **FINAL**.☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims☒ Claim(s) 1-31 is/are pending in the application.Of the above, claim(s) 20-27 is/are withdrawn from consideration.☐ Claim(s) _____ is/are allowed.☒ Claim(s) 1-19 and 28-31 is/are rejected.☐ Claim(s) _____ is/are objected to.☐ Claims _____ are subject to restriction or election requirement.**Application Papers**☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.☐ The drawing(s) filed on _____ is/are objected to by the Examiner.☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.☐ The specification is objected to by the Examiner.☐ The oath or declaration is objected to by the Examiner.**Priority under 35 U.S.C. § 119**☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.☐ received in Application No. (Series Code/Serial Number) _____.☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).**Attachment(s)**☒ Notice of References Cited, PTO-892☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 15☐ Interview Summary, PTO-413☐ Notice of Draftsperson's Patent Drawing Review, PTO-948☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Continued Prosecution Application

The request filed on 6-19-00 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/144,607 is acceptable and a CPA has been established. An action on the CPA follows.

Claim Rejections - 35 U.S.C. § 103/102(b)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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Claims 1-7 and 10 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Collins et al.(5,482,617).

Applicants are claiming a process for reducing the sulfur content of a catalytically cracked gasoline. The processes involve catalytically cracking a petroleum feed containing organosulfur compounds in the presence of a cracking catalyst and a product sulfur reduction catalyst.

The reference of Collins et al.(5,482,617) discloses a desulfurization process for a catalytically cracked feedstream derived from an FCC process. See column 2, lines 38-55. The reference discloses that the hydrocarbon feedstream processed preferably contains an olefin along with aromatic components including benzene. See column 3, lines 11-15. The sources of such components include reformates and/or cracked pyrolysis and coker fractions. See column 3, lines 29-30. The process comprises contacting a feed containing organic sulfur compounds with a fluidized catalyst at elevated temperatures in the range of 700-850°F. See column 2, lines 30-36 and column 4, lines 4-5. The reference further teaches that the catalyst is regenerated using standard commercial air supply and catalyst handling equipment and that the product stream can be fractionated with associated process equipment. See column 6, lines 50-65. A product that is derived from the process is a gasoline range material. See column 5, line 2.

The reference teaches that the catalyst comprises a large pore molecular sieve in the form of a faujasite, a zeolite beta or a USY. See column 4, lines 35-38 and 62. The reference teaches that the catalyst may also comprise an intermediate pore size zeolite such as ZSM-5 or MCM-49. See column 4, lines 5-10. The reference further discloses that the molecular sieve component

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comprises a metal component such as a Group IB, IIB, IIIB, VA, VIA or VIIA metal. See column 5, lines 29-34. Collins et al.(5,482,617) discloses that zinc is a suitable metal. See column 5, line 42. The reference teaches a zeolite with a silica:alumina molar ratio in the range of 25:1 to 70:1. See column 5, lines 23-24. The particle size is in the range of 10-300 microns. See column 4, lines 55-58. The reference further teaches that the zeolite can be combined with a matrix material. See column 4, lines 20-22.

The reference of Collins et al.(5,482,6170) succeeds in disclosing a process with steps corresponding to applicants' claimed catalyst contacting, regeneration and fractionation. Furthermore, the reference also succeeds in disclosing a catalyst with components corresponding to those claimed by applicants. The reference's disclosure of a feed containing olefins and aromatics such as a reformat is considered to encompass applicants' heavy feed.

It is noted that the reference does not refer to the disclosed zeolites/molecular sieves as cracking catalysts or product reduction catalysts. However, the disclosed compositions are considered to act in the capacity of cracking catalysts/product reduction catalysts because they would inherently accomplish the same conversion since they are contacted with the same feed under the same reaction conditions.

Applicants' process is anticipated by the reference of Collins et al.(5,482,617) because it discloses the same process steps and catalyst components.

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The presently claimed "cracking" and "product reduction" capabilities of the catalyst would obviously have been provided as a result of the operation of the Collins et al.(5,482,617) process.

Claim Rejections - 35 U.S.C. § 103

Claims 8, 9, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al.(5,482,617) in view of Chu et al.(5,057,203).

See teachings of Collins et al.(5,482,617) above.

Several differences are noted between the reference of Collins et al.(5,482,617) and applicants' claimed invention. The reference is silent about the alpha value and unit cell size of the disclosed zeolites.

The reference of Chu et al.(5,057,203) is cited for the general teaching that it is known in the art that the alpha value of a composition is directly related to its cracking ability. See column 4, lines 4, lines 43-46. The reference discloses that a USY with a an alpha value of .1 to 1000 and a unit cell size of 24.25-24.50 is suitable for hydrocarbon conversions such as cracking. See column 1, lines 10-12, column 7, lines 61-62 and column 8, lines 14-15.

Since the reference of Collins et al.(5,482,617) does not limit the alpha value of the disclosed compositions, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select a USY component with the alpha values and unit cell sizes

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disclosed by Chu et al.(5,057,203) because the reference of Chu et al.(5,057,203) discloses that a USY with such characteristics is suitable hydrocarbon conversions such as cracking.

Claim Rejections - 35 U.S.C. § 103

Claims 11-14, 17-19 and 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al.(5,482,617).

See teachings of Collins et al.(5,482,617) above.

Several differences are noted between the reference of Collins et al.(5,482,617) and applicants' claimed invention. The reference is silent about the treatment of a vacuum gas oil, the specific catalyst regeneration steps and the use of a "riser reactor" apparatus.

It would have been obvious to one of ordinary skill in the art practicing the Collins et al.(5,482,617) process to utilize any regeneration steps which would regenerate the catalyst, including applicants' regeneration steps in pending claim 11, because Collins et al.(5,482,617) does not limit the specific regeneration steps accomplished by the disclosed standard commercial air/ catalyst handling equipment. Applicants have not shown anything unexpected with respect to the specific regeneration steps. Such steps appear to be conventional in the art.

Also, applicants' "riser reactor" limitation is not considered to be a patentable distinction because it is an apparatus limitation which does not affect the process steps in a manipulative sense. It would have been obvious to one of ordinary skill in the art at the time the invention was

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made to select any apparatus which would accomplish the desired removal of sulfur, including a riser reactor, because it has been held that invention in a method must be found in the steps performed and not the apparatus employed. Ex Parte Hart, 117 USPQ 193 (Bd. Pat. App. & Int. 1958).

In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to treat any hydrocarbon stream containing unwanted organic sulfur compounds according to the Collins et al.(5,482,617) process, including applicants' specific vacuum gas oil, because the reference of Collins et al.(5,482,617) does not limit the specific organic sulfur containing feeds treated. In the absence of unexpected results, it appears that any hydrocarbon feed containing organic sulfur compounds could be treated according to the Collins et al.(5,482,617) process.

Response to Arguments

Applicants' arguments filed 5-28-99 have been fully considered but they are not persuasive.

Applicants argue the reference of Collins et al.(5,482,617) uses a low boiling point range feed which is distinct from the heavy feed used in the catalytic process of the present invention. Applicants also argue the Collins process is not a catalytic is not a cracking process.

Applicants' arguments with respect to the difference in feed are not persuasive. The reference discloses that the feed can be derived from thermally cracked pyrolysis and coker

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fractions. The thermally cracked pyrolysis fractions and coker fractions and/or reformat are considered to correspond to applicants' "heavy hydrocarbon oil" feed. As a result, the reference of Collin et al.(5,482,617) is considered to disclose applicants' claimed feed.

Applicants' argument wherein the Collins et al.(5,482,612) is not a catalytic cracking process is not persuasive. The reference similarly discloses contacting the feed with a catalyst at "elevated temperatures" which would accomplish cracking because the same feed is contacted with the same catalyst under the same elevated conditions. Applicants' have not shown that the Collins et al. process does not accomplish cracking.

Prior Art of Record

The prior art made of record and not relied upon is considered pertinent to applicants' disclosure.

The attached references of Chen et al.(4,740,292) and Chen et al.(4,911,823) disclose the alpha acidities of cracking catalysts.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nadine Preisch whose telephone number is (703) 305-2667. The examiner can normally be reached on Nadine Preisch from 7:30 am to 6:00 pm.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

September 14, 2000
N.P.

N.P.

NADINE PREISCH
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Nadine Preisch